



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,376	01/15/2004	Xinliang David Li	200313024-1	5436

22879	7590	01/03/2008
HEWLETT PACKARD COMPANY		
P O BOX 272400, 3404 E. HARMONY ROAD		
INTELLECTUAL PROPERTY ADMINISTRATION		
FORT COLLINS, CO 80527-2400		

EXAMINER	
KANG, INSUN	

ART UNIT	PAPER NUMBER
2193	

NOTIFICATION DATE	DELIVERY MODE
01/03/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

JERRY.SHORMA@HP.COM
mkraft@hp.com
ipa.mail@hp.com

Office Action Summary

Application No.

10/758,376

Applicant(s)

LI ET AL.

Examiner

Insun Kang

Art Unit

2193

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-18 and 20-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-18 and 20-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is in response to the amendment filed on 10/5/2007.
2. As per applicant's request, claims 3 and 19 have been canceled, claims 1, 4-7, 20, 22, 26, and 31-35 have been amended. Claims 1, 2, 4-18, and 20-35 are pending in the application.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 4-14, 16-18, 20-23, 25-29, 31-33, and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Sato (US Patent 6,292,940).

Per claim 1:

Sato discloses:

- accessing a first file including source code therein; accessing a second file including object code therein and further including object file summary information (i.e. col. 9 lines 50-65)
- and further including object file summary information; and generating the executable binary file from at least the first and second files (i.e. col. 12 lines 54-57)
- wherein the object file summary information is used in optimizing the executable binary file generated (i.e. col. 12 lines 40-47).

Per claim 2:

Sato further discloses:

- disambiguating memory accesses otherwise considered aliased using the object file summary information (i.e. col. 10 lines 15-24).

Per claim 4:

Sato further discloses:

- wherein the extension to the linker symbol table includes a flag indicating whether a procedure exposes a memory address by storing the address in a location accessible outside the procedure (i.e. col. 16 lines 19-29).

Per claim 5:

Sato further discloses:

- wherein the SIR includes a summary symbol table (i.e. col. 12 lines 20-25).

Per claim 6:

Sato further discloses:

- wherein the summary symbol table includes global and static symbols accessed in the procedure, formal parameters of the procedure, return location for the procedure, and other procedures called by the procedure (i.e. col. 6 lines 60-64).

Per claim 7:

Sato further discloses:

- wherein a symbol is referenced in the summary symbol table in using an associated summary symbol identifier (SYMID) (i.e. col. 10 lines 15-25).

Per claim 8:

Sato further discloses:

- wherein a symbol entry includes a linker identifier (LI_ID) of the entry from a linker symbol table (i.e. col. 10 lines 15-25).

Per claim 9:

Sato further discloses:

- wherein the SIR uses an operator for memory referencing (i.e. col. 12 lines 62-67).

Per claim 10:

Sato further discloses:

- wherein the SIR uses an operator to adjust the address expression by an offset (i.e. col. 12 lines 54-62).

Per claim 11:

Sato further discloses:

- wherein the SIR uses an operator to take an address of a function or variable (i.e. col. 12 lines 33-39).

Per claim 12:

Sato further discloses:

- wherein the SIR uses an operator to merge pointer values from different control flow paths (i.e. col. 12 lines 62-67).

Per claim 13:

Sato further discloses:

-vwherein the SIR uses an operator to represent direct procedure calls (i.e. col. 10 lines 35-38).

Per claim 14:

Sato further discloses:

- wherein the SIR uses an operator to represent indirect procedure calls (i.e. col. 10 lines 20-25)..

Per claim 16:

Sato further discloses:

- wherein the SIR includes a control data structure comprising a link field for each procedure that points to an SIR block of a next procedure (i.e. col. 2 lines 35-40).

Per claim 17:

Sato further discloses:

- the SIR includes a control data structure comprising a table having links to an SIR block for each procedure (i.e. col. 10 lines 15-24).

Per claim 18:

Sato further discloses:

- determining variables modified by and referenced by function calls in the object code using the object file summary information (i.e. col. 6 lines 42-59).

Per claim 20:

Sato further discloses:

- wherein the extension to the linker symbol table includes a first flag indicative of whether a procedure modifies non-local variables and a second flag indicative of whether the procedure references non-local variables (i.e. col. 9 lines 25-37; col. 13 lines 14-25).

Per claim 21:

Sato further discloses:

- wherein the extension to the linker symbol table includes a second flag indicative of whether the procedure modifies global/static variables excluding callees and a third flag

indicative of whether the procedure references non-local variables excluding callees (i.e. col. 13 lines 14-25; col. 14 lines 52-61).

Per claim 22:

Sato further discloses:

- wherein the per-procedure summary data comprises a linked list of entries corresponding to symbols directly mod-refined in a procedure (i.e. col. 15 lines 4-17)..

Per claim 23:

Sato further discloses:

- wherein each entry comprises a linker identifier of a corresponding symbol and flags indicative of whether that symbol is modified or referenced (i.e. col. 15 lines 19-30).

Per claim 25:

Sato further discloses:

- wherein multiple files including object code are accessed and used in compiling the program (i.e. col. 12 lines 20-25).

Per claims 26-27, they are the system versions of claims 1-2 respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1-2 and 13 above.

Per claim 28:

Sato further discloses:

- a module that uses the object file summary information to determine variables modified by and referenced by function calls in the object file (i.e. col. 16 lines 19-30).

Per claim 29:

Sato further discloses:

- the translator comprises: a compiler configured to translate source files into intermediate files; and a linker configured to access the object file summary information and communicate information to the compiler relevant to optimizing compilation of the program (i.e. fig. 4).

Per claims 31-33 and 35, they are the object file versions of claims 1, 3, 5, 6, and 22 respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1, 3, 5, 6, and 22 above.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 15 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato (US Patent 6,292,940) in view of Haber et al. (US Patent 6,966,055) hereafter Haber.

Per claim 15:

Sato does not explicitly teach the SIR uses a no-operation type operator to discard values. However, Haber teaches such a nop instruction was known in the pertinent art, at the time applicant's invention was made, to replace with any removed or redundant code (i.e. col. 5 lines 5-10). It would have been obvious for one having ordinary skill in the art to modify Sato's disclosed system to incorporate the teachings of Haber. The modification would be obvious because one having ordinary skill in the art would be motivated to replace any removed instructions for timing purposes.

Per claim 34:

It is the object file version of claim 9-15, respectively, and is rejected for the same reasons set forth in connection with the rejection of claims 9-15 above.

7. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato (US Patent 6,292,940) in view of Hiranandani et al. (US Patent 5,812,855) hereafter Hiranandani.

Per claim 24:

Sato does not explicitly teach that the second file comprises a load module that is a shared library of procedures. However, Hiranandani teaches it was known in the pertinent art, at the time applicant's invention was made, to reuse existing code (i.e. col. 9 lines 42-46). It would have been obvious for one having ordinary skill in the art to modify Sato's disclosed system to

incorporate the teachings of Hiranandani. The modification would be obvious because one having ordinary skill in the art would be motivated to gain faster execution and code reusability.

8. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato (US Patent 6,292,940) in view of Soroker et al. (US Patent 6,219,834) hereafter Soroker.

Per claim 30:

Sato does not explicitly teach a feedback provider that provides a communications interface between the compiler and the linker. However, Soroker teaches compiler extensions comprising APIs for communication between a compiler and a linker was known in the pertinent art, at the time applicant's invention was made, to enable the communication among different programs (i.e. col. 2 lines 66 to col. 3 line 17). It would have been obvious for one having ordinary skill in the art to modify Sato's disclosed system to incorporate the teachings of Soroker. The modification would be obvious because one having ordinary skill in the art would be motivated to enhance the communication functionality of the compiler with the linker.

Response to Arguments

9. Applicant's arguments filed on 10/5/2007 have been fully considered but they are not persuasive.

The applicant states that 1): Sato does not disclose an extension to a linker symbol table.

In response to the statement 1), In Sato, the temporary object program is used for linking (ie. Col. 12 lines 20-39).

The applicant states that 2): Sato does not teach disambiguating memory accesses.

In response to the statement 2), Sato resolves the unresolved references from indirect calls and dynamic information (i.e. col. 12 lines 40-53).

The applicant states that 3): Sato does not disclose a symbol table and linker identifier.

In response to the statement 3), it is inherent that the symbol table is created at a compile-time holding information for definitions and references and the linker uses the symbol table to resolve any references. Sato's object file contains the symbol table.

The applicant states that 4): Sato does not disclose flag indicating whether a procedure exposes a memory address and operator for memory referencing, adjusting an address expression by an offset and merging pointer values from different control flow paths.

In response to the statement 4), Sato discloses that the operator can specify the address of a position of an indirect call procedure code in the object program (i.e. col. 16, lines 1-30).

The applicant states that 5): Sato does not disclose determining variables modified and referenced by function calls in the object code using the object file summary information.

In response to the statement 5), Sato discloses that the object program summation contains information regarding every position of indirect call codes and dynamic information (i.e. col. 12 lines 40-53).

Conclusion

10. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after

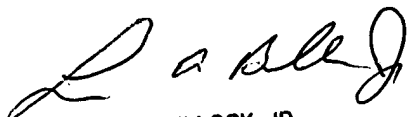
the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Insun Kang whose telephone number is 571-272-3724. The examiner can normally be reached on M-F 8:30-5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MENG AI AN can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

IK
AU 2193


LEWIS A. BULLOCK, JR.
PRIMARY EXAMINER